

These are some notes from the **NCEP / EMC Global Climate and Weather Modeling Branch's** bi-weekly briefings for July 2005. The individual meeting notes have more details (questions may be addressed to kenneth.campana@noaa.gov). Please check: http://www.emc.ncep.noaa.gov/gmb/KENS_PLACE/Glob_MapBrief

T382 GFS:

Precipitation threat and bias scores over N America have been compared before and after T382 model implementation on May 31. Scores after implementation are improved relative to scores from other international Centers. Two-meter temperature and relative humidity over the US are better in the T382 model.

A remaining problem with the new GFS is its predictions in the East Pacific region (poor hurricane tracks, larger RMS errors than other Centers, *etc*). Problems are generally similar to the older version of the GFS, but the wind fields seem better in the T382 forecasts. Case studies are being used to help understand the problems.

Evaluation of GFS Snow Data in Italy:

An Italian researcher, using GFS ½ deg snow data to initialize his workstation version of the regional NAM, noted that there is unrealistic snow cover analyzed in the Po River valley. A study of 00Z April 7, 2005 (old T254 GFS) shows that several horizontal interpolation steps contribute to spreading the realistic snow cover that exists elsewhere in Italy. Tests, which reduce some extra horizontal interpolation, result in a much more realistic snow cover pattern in the Po valley. Tests with the T382 model show even better improvement. Use of the NESDIS 4km resolution data, rather than a 23km version, also provides improvement.

GFS Hybrid (sigma-theta) Vertical Coordinate

Details of the generalized hybrid vertical coordinate model may be found in NCEP Office Note #445. The new model requires changes to the vertical finite difference calculation and uses surface pressure, rather than natural log of surface pressure. A great deal of testing with different horizontal resolutions has been done to ensure the new code is working properly. Tests using a T254L64 version produce 24-hour forecasts similar to a control run, and it takes approximately 15% more CPU time.

A new Analysis for the GFS

The GSI (grid-point statistical interpolation) analysis will eventually replace the operational SSI (spectral statistical interpolation). It is a grid version of the SSI, with different variables (no vorticity / divergence) and new background error definition. It is an easier-to-maintain code and runs more efficiently (20-40% faster). The effect of a single observation on the GSI analysis is more localized (*i.e.* smaller area) than the SSI. Even though successful experiments have been made at T382L64, more routine testing is required, so the GSI has been placed in EMC's parallel-to-operations run!

Stochastic Dynamics in the GFS

A first attempt has been made to include stochastic dynamics in the GFS. A stochastic differential equation for vorticity contains additive and multiplicative noise terms. One additive term was chosen, and tests were made using a T126L28 GFS model for the Jan 5, 2005 case! The zonal mean wind profile at 45N, 160E, north of the Asian jet, was studied; and the forecast appeared reasonable at day 2, but there were many unrealistic ‘wiggles’ in the wind profile by day 4. Future work will be to study other terms and equations, to develop efficient methods to ‘tune’ the system, and to investigate its use in ensemble forecasting.

Temperature Bias Differences in Upper Air Reports

Temperature bias (OBS-GDAS guess) for radiosondes is of order 0.2-0.6 degrees cold, between 200-300 mb, while aircraft data is biased warm by 0.2 degrees. The NCEP Radiation Correction (RADCOR) applied to radiosonde reports may be duplicating what Chinese stations are doing before their data is transmitted. Additionally, US ‘sondes’ have a warm bias in the stratosphere. Future work includes a review and possible updating of RADCOR, development of a modified correction over the US, and removal of NCEP’s use of RADCOR for the Chinese data.